Figures 4A-4E show the chemical structures of a number of bidentate ligands of the present invention.

Figures 5A-5BE show the chemical structures of a number of tridentate ligands of the present invention.

Figures 6A-6C are structural diagrams showing examples of the preference of metals for different types of ligands useable in the preparation of the complexes of the present invention.

Figure 7 is a schematic showing of the use of a Brookhart catalyst (1) of the prior art in a polyolefin polymerization reaction.

Figure 8 shows the chemical structure of an Ni-cyclophane diimine catalyst (2) of the present invention.

Figure 9 is a schematic diagram of an experiment wherein 1-hexene was polymerized in the presence of a Ni-cyclophane diimine catalyst of the present invention and two prior art catalysts, to form poly(1-hexene) polymers.

Figure 10 is a table setting forth catalyst activity and polymer molecular in the experiment of Figure 9.

Figure 11 is a graph comparing the catalytic activities of a Ni-cyclophane diimine catalyst of the present invention and two prior art catalysts, at various temperatures, in the experiment of Figure 9.

DETAILED DESCRIPTION

The present invention provides transition metal catalysts that are relatively stable at high temperatures and are useable to produce high molecular weight olefin polymers at high temperature. The improved temperature stability of these catalysts renders them useable for various types of olefin polymerization processes, including industrial gas phase olefin polymerization processes.

Examples of catalysts of the present invention may be formed by the complexation between a new cyclophane-based ligand with Ni(II) and other transition metal ions. As described in Section A of the detailed description set forth herebelow, the catalysts of the present invention show very high activity for ethylene polymerization to produce high molecular weight polymers. Also, as described in Section B of the detailed description set forth herebelow, the catalysts are also active in polymerizing α-olefins. An important attribute of the